What is claimed is:

1. A process for the production of difluoromethane comprising:

(a) contacting dichloromethane with hydrogen fluoride in the presence of a fluorination catalyst to produce a product stream comprising difluoromethane, monochloromonofluoromethane, and unreacted starting materials and

(b) separating difluoromethane from the product stream from step (a) wherein sufficient hydrogen fluoride is employed in the process such that during step (b) the molar ratio of hydrogen fluoride to monochloromonofluoromethane is at least about 100:1.

2. A process as claimed in claim 1, in which the molar ratio of hydrogen fluoride to monochloromonofluoromethane is at least about 150:1.

3. A process as claimed in claim 1 in which additional hydrogen fluoride is added to the process stream recovered from step (a) in order to ensure that the required ratio of hydrogen fluoride to HCFC-31 is achieved during step (b).

4. A process for the production of difluoromethane comprising (a) contacting dichloromethane with hydrogen fluoride in the presence of a fluorination catalyst to produce a product stream comprising difluoromethane, monochloromonofluoromethane and unreacted starting materials, (b) separating difluoromethane from the product stream from step (a) and (c) recovering difluoromethane and recycling HCFC-31 to step (a) wherein sufficient hydrogen fluoride is employed in the process such that during step (b) the molar ratio of hydrogen fluoride to monochloromonofluoromethane is at least about 100:1.

5. A process as claimed in any one of claims 1 to 4 in which the separation step (b) comprises distilling the product stream from step (a) whereby to separate a top stream comprising difluoromethane and hydrogen chloride from a bottom stream comprising hydrogen fluoride, HCFC-31 and unreacted dichloromethane.

6. A process as claimed in ~~any one of claims 1 to~~ Claim 5 in which the fluorination catalyst comprises a metal oxide, metal fluoride or oxyfluoride.

7. A process as claimed in claim 6 in which the metal of the oxide, fluoride, or oxyfluoride is at least one of chromium, aluminum, zinc, nickel, cobalt, copper and magnesium.

8. A process as claimed in claim 7 in which the catalyst comprises zinc or a compound of zinc and a metal oxide, fluoride or oxyfluoride in which the metal of the oxide, fluoride or oxyfluoride is chromium or aluminum.

9. A process for producing difluoromethane comprising the steps of:

(A) preheating a composition comprising hydrogen fluoride and dichloromethane to form a vaporized and superheated composition;

(B) reacting the preheated composition of step (A) in the presence of a fluorination catalyst under conditions suitable to form a product stream comprising difluoromethane, chlorofluoromethane, hydrogen chloride, dichloromethane and hydrogen fluoride;

(C) recovering by distillation from the product stream of step (B) a high boiling fraction comprising hydrogen fluoride, dichloromethane, and chlorofluoromethane and a low boiling fraction comprising difluoromethane, hydrogen chloride, hydrogen fluoride, and reaction byproducts; and

(D) recovering substantially pure difluoromethane from the low boiling ~~fraction of step~~ (C).

10. The process of claim 9 wherein the hydrogen fluoride and dichloromethane are present in a mole ratio of from about 1:1 to about 10:1.

11. The process of claim 9 wherein the composition of step (A) further comprises chlorofluoromethane.

12. The process of claims 9 or 11 wherein the hydrogen fluoride and the chlorofluoromethane are present in the product stream in a mole ratio of at least about 25:1 to at least about 300:1.

13. The process of claims 9 or 11 wherein the hydrogen fluoride and the chlorofluoromethane are present in the product stream in a mole ratio of at least about 50:1 to at least about 200:1.

14. The process of claims 9 or 11 wherein the hydrogen fluoride and the chlorofluoromethane are present in the product stream in a mole ratio of at least about 75:1 to at least about 150:1.

15. The process of claims 1 or 9 wherein the fluorination catalyst is a pretreated fluorination catalyst

16. The process of claims 1, 9 or 15 wherein the fluorination catalyst is chromium oxide.

17. The process of claim 9 wherein the high boiling fraction of step (C) is recycled to step (A).

18. The process of claim 9 wherein step (D) further comprises the substeps of:

(E) treating the low boiling mixture of step (C) in an HCl distillation column or an aqueous HCl absorption tower under conditions suitable to remove HCl and trace HF to form a crude HFC-32 product;

(F) treating the crude HFC-32 product formed in step (E) with a first caustic scrubber under conditions suitable to form a neutralized product;

(G) treating the neutralized product of step (F) in a second caustic scrubber under conditions suitable to form a substantially chlorine-free product;

(H) treating the substantially chlorine-free product of step (G) with a sulfuric acid scrubber and subsequently with a solid desiccant to form a substantially moisture-free product; and

(I) distilling the substantially moisture-free product of step (H) under conditions suitable to produce substantially pure difluoromethane.